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BIOLOGICAL SOCIETY OF WASHINGTONANOTHER NEOTENIC *EURYCEA* FROM THE
EDWARDS PLATEAU

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Among the specimens of supposed *Eurycea neotenes* stained and cleared for comparison with *Eurycea latitans* prior to the description of the latter species, were 6 specimens from Fern Bank Spring, 6.3 miles northeast of Wimberley, Hays Co., Texas. Although 11 other specimens from the same collection were virtually indistinguishable in external morphological characters from topotypic *Eurycea neotenes*, the stained specimens revealed a number of osteological differences we regard as sufficiently marked and constant to warrant taxonomic recognition.

Practical taxonomists may object to the use of any but external morphological characters in the diagnosis of species or subspecies. However, natural populations may differ in internal anatomical, physiological, or cytological characters in addition to external morphological characters. If the biological concept of species is to be followed no alternative remains but to recognize taxonomically any form which can be identified by objectively determinable characters.

The Fern Bank species is undoubtedly a micropopulation of extremely limited geographic distribution, inhabiting an area perhaps no greater than 2500 square feet. This situation is not unlike that of *E. nana*, known only from one spring pool, and *E. latitans*, known from only one cavern. *E. neotenes* may or may not eventually be considered to possess a restricted range similar to the other forms; specimens tentatively referred to this species, from several different localities, may upon more careful scrutiny (as in the present case) be found to possess localized differentiae warranting nomenclatorial recognition. Careful exploration of the entire area populated by the *Euryceas* of Texas, and detailed comparison of specimens from all localities, are prerequisite for an adequate understanding of the distribution and taxonomy of these salamanders. The problems involved receive the present attention of one of us (Potter). In the meantime we present the following description of the Fern Bank species as an outgrowth of the original study of *E. latitans*.

Eurycea pterophila,*** sp. nov.

Holotype. Adult female, Floyd Potter Coll. No. A993, taken in the shallow stream flowing from Fern Bank Spring, 6.3 miles northeast of

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***From the Greek *ptēris*, a fern, and *philos*, loving.

APR 28 1950

Wimberley on the Blanco River road, Hays County, Texas, by Floyd E. Potter, Jr. on May 22, 1946. *Paratypes*. Ten (Floyd Potter Nos. A989-A992, A994-A999), all taken at the type locality at the same time as the holotype. *Hypoparatypes*. Six specimens (H. M. Smith Nos. G1, G3-G7), also from the same series, stained with alizarine red and cleared in glycerine.

Diagnosis. Indistinguishable from *Eurycea neotenes* in external morphology. This form is distinctive in several features of the skeleton: the irregularly Y-shaped posterior basibranchial; the single articulation of the last rib; tuberculum of penultimate rib approximately twice as long as capitulum but less than length of shaft of rib; phalanges irregularly reduced in number.

Description of holotype. Head definitely flattened with only a very slight elevation in the interorbital region; eyes lidless, diameter .80 of the interorbital distance and .63 of the snout length; nostrils near the upper lip at the angle of the rather truncate jaw, separated from each other by a distance about equal to the snout length; conspicuous creases from the eye to the corner of the mouth and from the corner of the mouth posterodorsal over the base of the gills.

Three gills, fairly well developed, the largest reaching almost to the eye when adpressed anteriorly and to the elbow when both leg and gills are adpressed posteriorly; gills heavily pigmented, with 1-3 rows of dark brown chromatophores extending down the center of each of the filaments $\frac{3}{4}$ or more of the total distance to the tip; gular fold curving slightly posteriorly on each side from the middle of the throat.

Forelegs short, well-developed; fingers 1 - 2 - 4 - 3, in order of increasing length; hind legs longer and stouter; toes 1 - 5 - 2 - 4 - 3, in order of increasing length.

Costal grooves 16 (counting not more than one groove in either axilla or groin); 7 grooves between adpressed limbs; narrow yellowish strip of glandular tissue extending posteriorly along the midventral line from the anus $\frac{4}{5}$ the length of the tail.

Coloration in preservative finely mottled brown and yellow above, darkening somewhat laterally; top of head darkly mottled, the color fading posteriorly in the middle of the back except in a narrow, mid-dorsal area and along the costal grooves, which are darker; dorsal fin, which originates at a point above the base of the hind legs, bordered by a dull orange stripe extending $\frac{4}{5}$ the length of the tail; mottled brown color extending down sides of tail and lightening only slightly before reaching the yellow glandular stripe; chin, ventrum of body, and lower half of sides yellow.

Variation. The shape of the posterior basibranchium and that of the penultimate rib do not vary greatly from the condition given in the diagnosis. The total number of phalanges is reduced in this form from 16 (phalangeal formula 2-3-4-4-3), the basic number in related forms, to 11-16 (average 12.1) on the hind limb, and from 12 (phalangeal formula 2-3-4-3) to 10-12 (average 11.4) on the forelimb. The variation of other skeletal features in the hypoparatype series is given in Table I. Table II gives the variation of some of the important external morphological characters in the holotype and paratype series.

Comparisons. As previously stated *Eurycea pterophila* is indistinguishable from *E. neotenes* in external morphological features, and thus obviously differs from *E. nana* and *E. latitans* in the same way that

Table I. Variation in the hypoparatype series

Number of Specimen	No. of Phalanges Per Digit Ant. - Post.		Number of Presacral Vertebrae	Teeth				
	Forelimbs	Hindlimbs		Premax.	Vomerine	Pterygoid	Dentary	Spinal
G1	2-3-4-3	2-3-4-4-3	18	15	10-10	7-8	20-20	5-6
G3	2-3-4-3	2-3-4-4-3	18	12	8-8	7-6	19-20	7-9
	2-3-4-3	1-2-3-3-2						
G4	2-3-4-3	1-2-3-3-2	18	12	9-10	6-8	18-21	8-7
	2-3-4-2	2-3-3-3-2						
G5	2-3-4-2	1-3-3-3-2	18	15	11-11	9-9	21-22	9-9
	2-3-4-3	1-3-4-2-2						
G6	2-3-4-3	1-2-3-2-2	19	13	10-10	7-7	22-20	10-13
	2-3-3-2	1-3-3-3-0						
G7	1-3-3-2	1-3-3-3-0	18	11	9-9	7-7	20-20	11-12
	2-3-4-3	2-3-4-3-1						
	—	2-3-4-2-1						

Table II. Variation of the holotype and paratype series.

Number of Specimen	Sex	Snout-vent Length (in mm.)	Tail Length (in mm.)	Total Length (in mm.)	Eye Diameter (in mm.)	Inter-Orbital Width (in mm.)	Costal Grooves	Costal Grooves Between Adpressed Limbs
A989	♂	31	30½	61½	1.2	1.6	16	7
A990	♂	34½	31	65½	1.2	1.8	17	7
A991	♂	30	29	59	1.1	1.9	16	6
A992	♂	33	19+	52½+	1.2	2.0	16	7
A993	♀	31	28	59	1.1	1.5	16	7
A994	♀	31	28½	59½	1.2	1.6	16	7
A995	♀	29	—	—	1.1	1.4	15	6
A996	♀	28½	16½	45+	1.1	1.3	15	6
A997	♀	29½	26	55½	1.2	1.5	15	6
A998	♀	30½	10+	40½+	1.2	1.5	15	6
A999	♀	25½	21½	47	.9	1.2	16	6

E. neotenes (see Bishop, 1943, and Smith and Potter, 1946) does. The Y-shaped posterior basibranchium of this form is in marked contrast to the irregularly circular structure in *E. nana* and the T-shaped affair in *E. latitans*. In topotypic *E. neotenes* this structure is absent. The articulation of the last rib of *E. pterophila* is simple, while in *E. neotenes*, *E. latitans* and *E. nana* this articulation is differentiated into a capitulum and a tuberculum. In *E. pterophila* the tuberculum of the penultimate rib is approximately 1/2 the length of the capitulum while in the related forms the two processes of the penultimate rib are approximately equal in length.

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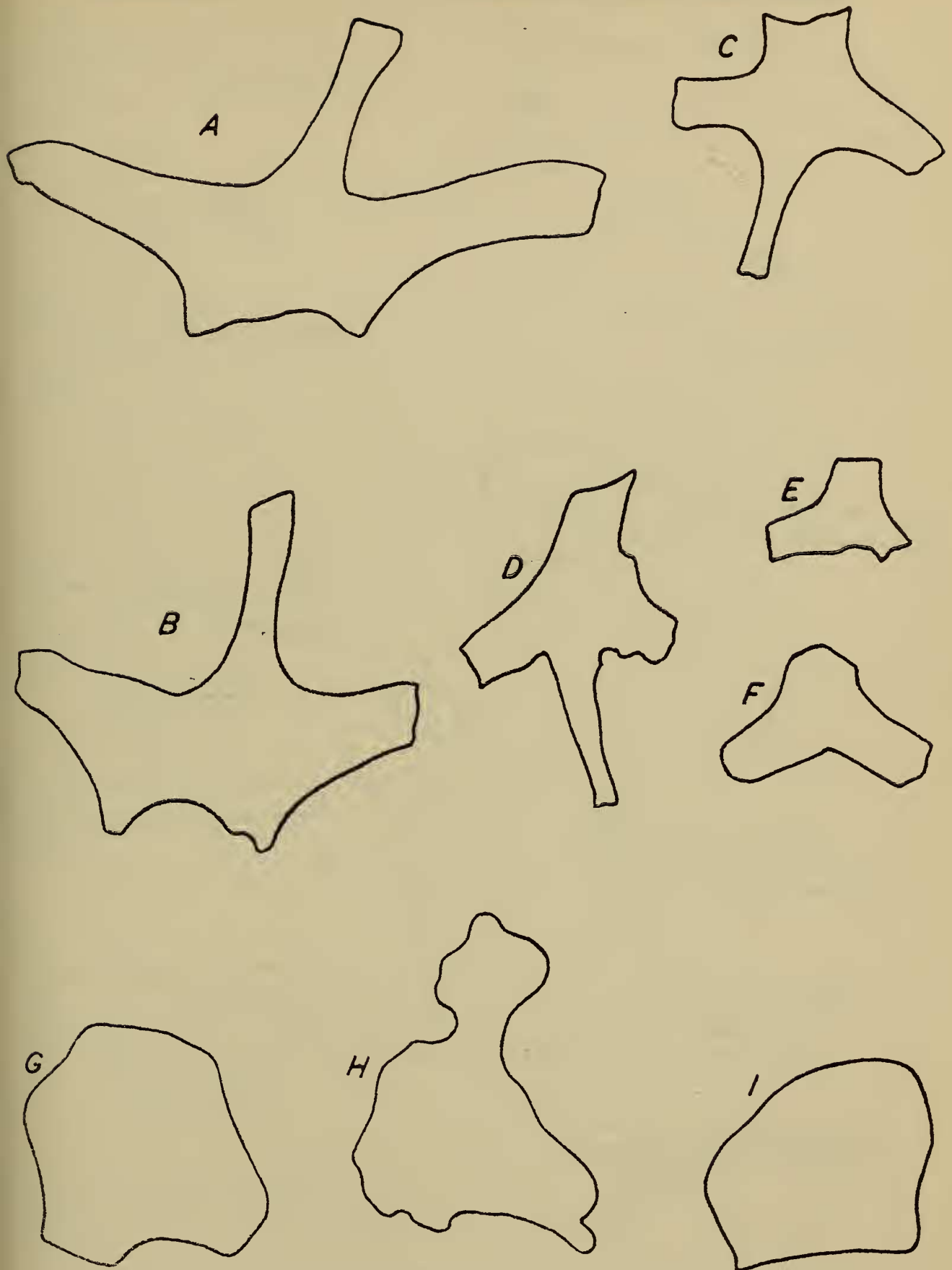


Plate V.—Posterior basibranchials of various species of *Eurycea*. A, *E. latitans*, 1.25×3.0 mm.; B, *E. latitans*, 1.7×2.0 mm.; C, *E. bislineata*, 1.5×1.2 mm.; D, *E. bislineata*, 1.0×1.1 mm.; E, *E. pterophila* (G1), 0.8×0.7 mm.; F, *E. pterophila* (G5), 1.0×0.7 mm.; G, *E. nana*, 0.6×0.5 mm.; H, *E. nana*, 1.3×1.8 mm.; I, *E. nana*, 0.4×0.4 mm.

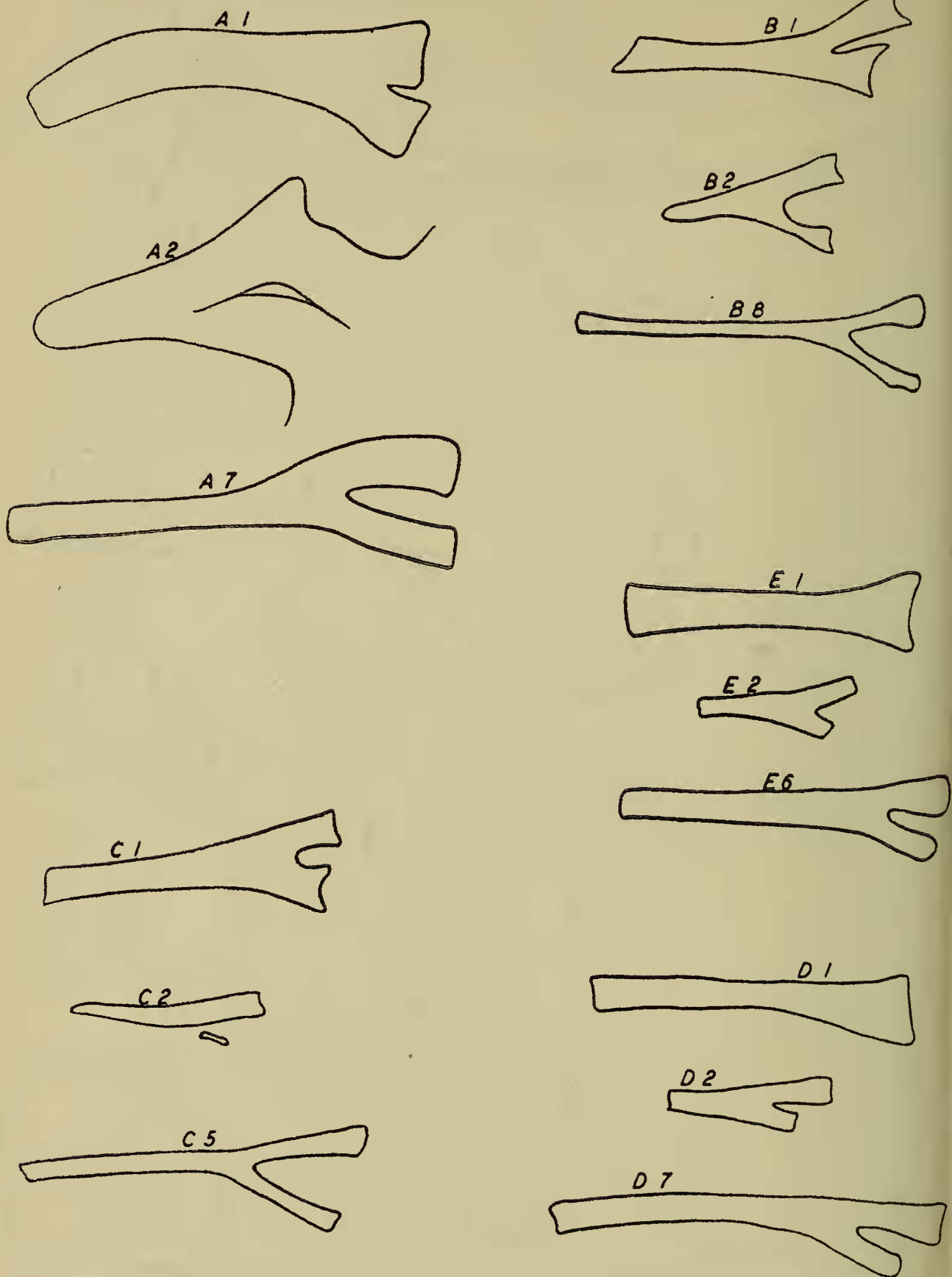


Plate VI.—Presacral ribs of various species of *Eurycea*, all $\times 43$. The number indicates the position of the rib counting forward from the sacrum. A, *E. latitans*; B, and C, *E. bislineata*; D and E, *E. pterophila*.

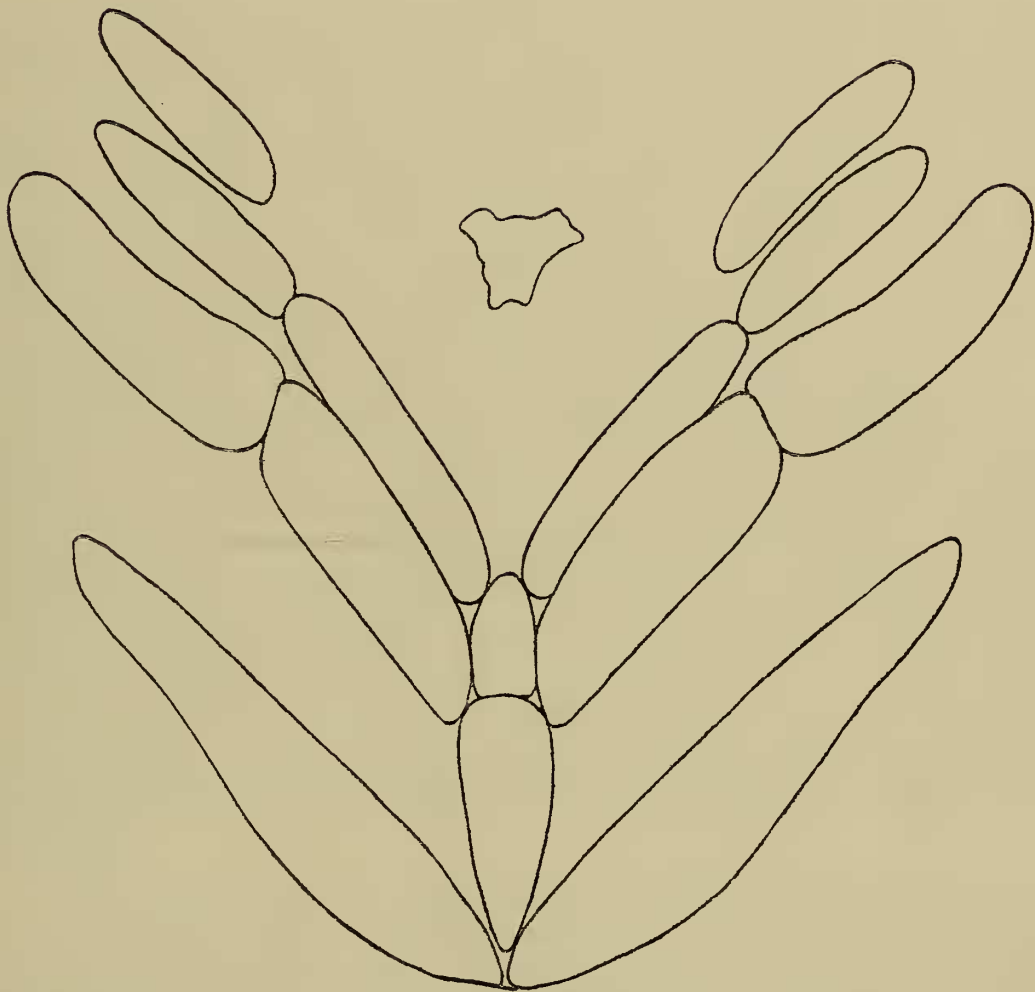


Plate VII.—Hyobranchium of *E. pterophila* (G1), 6.5 mm in width.

